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Exploring the 'Pet Effect': Does Playing with Pets Contribute to Owner Wellbeing?

Sarah Gradidge [1,*], Steve Loughnan [2] and Nic Gibson [1]

[1] School of Psychology and Sport Science, Anglia Ruskin University, East Road, Cambridge, CB1 1PT, UK; nic.gibson@aru.ac.uk
[2] School of Philosophy, Psychology and Language Sciences, University of Edinburgh, Old College, South Bridge, Edinburgh, EH8 9YL, UK; steve.loughnan@ed.ac.uk
* Correspondence: sarah.gradidge@aru.ac.uk

Abstract: Although many people strongly believe in wellbeing benefits of having pets (the 'pet effect'), research on the 'pet effect' in actuality is highly mixed. Surprisingly, little research has explored the nature of (i.e., specific components of) the human–pet relationship, as a way to explain the contradictory findings. One such component is human–pet play, with play outside of the human–pet relationship being important for wellbeing and social buffering. Thus, the current quantitative study explores whether greater perceived play with pets contributes to greater wellbeing ('pet effect') and reduces anxiety during a time of acute stress (social buffering). The study employs a regression design recruiting men and women residing in the UK during the COVID-19 pandemic who own a dog and/or cat, with perceived pet play as the key predictor variable, and outcome variables of wellbeing and COVID-19 anxiety. Data were gathered and analysed cross-sectionally on day one (N = 189), and longitudinally over five days (N = 105), using multiple regressions. Overall, perceived pet play did not predict wellbeing nor COVID-19 anxiety. As such, the current study indicates human–pet play does not contribute to the 'pet effect' nor social buffering, thus raising questions for future research regarding the exact purpose of play within the human–pet relationship.

Keywords: pet effect; play; wellbeing; dog; cat

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1. The 'Pet Effect': Pets and Wellbeing

We are currently experiencing a major mental health and wellbeing crisis [1], with demand outpacing the supply of mental health services. As people struggle, one common practice may be to acquire a pet or pets as an attempt to alleviate mental illness and improve wellbeing. Indeed, the internet abounds with articles purporting the benefits of having a pet, with titles such as 'the health and mood-boosting benefits of pets' [2], 'pets can contribute to greater personal wellbeing' [3], and 'why owning a pet is good for body and mind' [4], resonating with the majority of pet owners who perceive their pet as being beneficial for their wellbeing [5,6]. However, despite this widespread lay belief that pets are good for us (known as the 'pet effect'; [7]), the links between pet ownership and wellbeing are poorly understood, and existing literature provides conflicting evidence as to whether pets improve, undermine, or are unrelated to our wellbeing (see [8]). One reason for these mixed findings might be a lack of attention within the literature towards the *nature* of the pet–owner relationship [9], that is, despite the central role pets supposedly play in their owners' lives, we know surprisingly little about the dynamics of the pet–human relationship. In this paper, we explore a novel element of the pet–human relationship: interspecies play behaviour. We examine whether playing with pets is an important yet neglected factor in translating pet ownership into wellbeing.

The relationship between pet ownership and owners' physical and psychological wellbeing has been widely studied. As stated above, this work has tended to produce

mixed results, with some studies showing positive effects, some negative effects, and some no effects of pet ownership [8,10–12].

Several lines of work have shown that pets improve their owners' wellbeing, thus supporting the 'pet effect' [7]. For instance, pet owners have reported less loneliness and lower levels of anxiety [13,14] and depression [15]. These effects have been found to be especially pronounced amongst people experiencing vulnerability including the elderly [16], people living alone [17], and people living with serious illness (e.g., HIV-AIDS; [18]).

Pets can also be a powerful source of mental wellbeing during periods of crisis, with pet owners often reporting finding comfort in their pets 'when things go wrong' [19]. This comforting role of pets can be explained by social buffering theory, whereby social support from others protects (or 'buffers') against stress, and thereby enables ill health to be avoided [20]. Whilst 'others' has typically referred to other humans, there is no theoretical reason as to why this social buffering role could not be fulfilled by *non*-human companions. Indeed, some research has found that social buffering theory appears to also apply to pets. For example, during the COVID-19 pandemic, a time of high stress for many [21], adults with pets (compared to those without) experienced less loneliness and better mental wellbeing [22], more positive emotions, better psychological wellbeing, and better coping and self-efficacy [23]. These positive effects were especially found in people with moderate to high symptoms of mental illness [24]. In short, some research provides evidence that pets can enhance mental wellbeing and act as a buffer against stress.

By contrast, there also are a considerable number of papers which either do not find evidence for the 'pet effect', or which find that pet ownership even actively undermines wellbeing. For example, both careful matched-sample designs [13] and large-scale epidemiological studies [25] have failed to find evidence that pet ownership is linked to depression or anxiety. Likewise, longitudinal studies have found no evidence that pets reduce loneliness [26] nor that pets increase general wellbeing [27]. Indeed, some studies have found that pet ownership is actually linked to higher levels of mental illness, especially depression [28,29]. Combined with the findings above, there is no consistent picture of the relationship between pets and wellbeing. As such, research is needed to explore exactly why evidence for the 'pet effect' is so inconsistent. One way to explore these inconsistencies is by focusing on the dynamics of the pet–human relationships, specifically focussing on play between pets and their human owner.

2. Play and Wellbeing

Play is defined at the behavioural level as a typically repeated activity that is engaged in for amusement and fun, with enthusiasm and spontaneity, providing no obvious function and occurring when not under high stress [30–33]. At a trait level within humans, play is defined as a disposition to find opportunities for, and to engage in, play [34]. Play has been linked to the endorphin activation system [35,36], with a subsequently wide range of benefits. In particular, play, and especially social play, has previously been found to mitigate the negative effects of stress [37,38], and to be positively associated with happiness, wellbeing, and positive psychological functioning across the lifespan [39–42].

The positive role of play and playfulness in challenging and highly stressful times was highlighted in the context of the COVID-19 pandemic. For instance, more playful individuals perceived less stress and higher self-efficacy and used more active coping strategies to mitigate stress during the pandemic [43], alongside feeling less lonely and bored [44]. Play has also been found to be a buffer against stress more generally. For instance, greater playfulness is linked to lower stress both directly (i.e., more playful people experience lower stress; [37]), and indirectly. Specifically, more playful people experience fewer negative emotions, which subsequently buffers against some of the negative consequences of stress, as well as experiencing greater positive emotions and associated greater life satisfaction [45]. As such, play appears to be an important component

of social relationships which contributes not only to wellbeing more generally, but also to social buffering, thereby protecting against and/or lessening the impact of stress.

3. The Current Study: Linking the 'Pet Effect' and Play

We have explored the contradictory evidence for the 'pet effect', the positive effects of play on wellbeing, and the role of play as a social buffer against stressful events. Combining the literature, the positive effects of play on wellbeing, and as a buffer against stress, might be extended to pet–human play. Additionally, exploring pet–human play may clarify the contradictory findings for the 'pet effect', by measuring a possibly key component of the pet–human relationship. Surprisingly, to the best of our knowledge, previous literature has not yet explored pet–human play, either in its own right or in relation to wellbeing and anxiety. The current study therefore adds to and extends upon previous literature by applying the 'pet effect' to the context of pet–human play specifically.

Additionally, the COVID-19 pandemic provides a unique opportunity to understand any role of pet–human play in social buffering during an acute stressor. Specifically, exploring the impact of playing with pets during the COVID-19 pandemic enables a unique exploration of whether the positive effects of play on wellbeing extend to pet–human play within the context of a highly stressful life event with limited opportunities to engage in human-based social play. Thus, any social buffering role of play with pets can be explored, due to the stress of the pandemic, whilst companion animal play may be an alternative outlet to traditional play with other humans. As such, the current study collected data from participants during the COVID-19 pandemic and focused on acute COVID-19 anxiety as a measure of stress, thereby enabling the exploration of any buffering role of playing with pets.

Overall, the primary aim of the current study is to examine the relationship between perceived pet play and wellbeing and acute anxiety, asking the research question "does perceived pet play link to wellbeing and anxiety?" Consistent with the above-discussed prior work on the psychology of play, we hypothesise that a greater number of overall play behaviours will predict greater wellbeing (H1a) and lower anxiety (H1b). To accurately assess the relationships between perceived pet play and wellbeing and anxiety, the current study controls for participant gender, age and personality, as previous research indicates these three variables can all influence perceptions of and/or interactions with animals, wellbeing and anxiety levels [46–49].

Additionally, as this paper is the first to explore the psychology of play within the pet–human relationship, we utilise this unique opportunity to investigate three factors that may impact the quantity of pet–human play: pet life stage, human personal playfulness, and pet species. These variables are included both as exploratory variables and to control for any relationship between these variables and the quantity of pet–human play. Specifically, playfulness is included as an exploratory variable to allow play as a personality trait, not just as a behaviour, to be investigated, whilst pet life stage and species are included to see if play behaviours differ within pets across life stage (e.g., juvenile vs. adult vs. elder) and species (dog vs. cat). For instance, elderly pets may be less physically capable of play than non-elderly pets, whilst previous research indicates that play within dogs vs. cats may be inherently different, or at least perceived differently by owners [50,51].

4. Materials and Methods

4.1. Participants

Data were collected over a five-day period in March 2021. On day one, 200 UK residents (50% dog owners, 50% cat owners), recruited via Prolific, took part. Eleven participants were excluded from the regression analyses for not providing pet age (n = 3), reporting a gender other than male or female due to gender (male vs. female) being included as a covariate within analyses (n = 3), not providing a response to at least one item within the scales (n = 3), or not providing participant age (n = 2). Total sample size for the main regression analyses was 189 for day one (note that sample sizes differ

depending on which variables are included within each analysis; sample sizes are notedfor all analyses except the main regressions) (M_{age} = 34.21; SD_{age} = 11.89; age range = 18–65; 74.6% female; 96.8% UK nationality; 89.9% White). This sample size exceeds the minimum required sample size of 123 per a G*Power a priori power analysis for a multiple regression analysis (medium effect size f^2 = 0.15, α = 0.05, 80% power, 11 predictors). This sample consisted of owners of puppies or kittens (7.4%), owners of adult pets (69.8%), and owners of elderly pets (22.8%; see 'pet life stage' section below for details on how pet life stage was calculated).

Ultimately, 112 participants completed all five days. However, three participants were excluded from regression analyses for missing at least one perceived play item, whilst four participants were excluded as above for being a gender other than male or female (n = 2), not providing pet age (n = 1) or not providing a response to one of the personality items (n = 1). These exclusions left a total five-day sample for the main regression analyses of 105 (52.4% dog owners; M_{age} = 37.06; SD_{age} = 11.98; age range = 19–65; 73.3% female; 96.2% UK nationality; 88.6% White). This five-day sample was lower than the minimum required sample size per G*Power described above and so results from this sample should be interpreted with caution. The five-day sample consisted mostly of owners of adult pets (64.8%), followed by owners of elderly pets (29.5%) then owners of puppies or kittens (5.7%). All participants received GBP 1.40 (USD 1.72) per day as reimbursement for their participation, for a maximum possible total of GBP 7 (USD 8.62).

4.2. Pet Life Stage

Simple measurement of pet age (e.g., years) can provide a distorted measure of pet life stage, as 'years of age' does not account for differences in lifespan and development between (e.g., dog vs. cat) or within (e.g., pet breeds) pet species. Pets were classified into life stages using the average age at which an animal stops growing to mark adulthood and the average age of developing age-related diseases to mark old age. These average ages were divided in relation to the pet species' average lifespan, giving numerical cut-off thresholds for juvenile and elderly pets. These numerical cut-off thresholds were then compared against each individual pet's lifespan 'number' (the pet's age divided by its average lifespan). Pets with a lifespan number at or below the juvenile threshold were classed as juveniles, whilst pets at or above the elderly threshold were classed as elderly pets. All other pets were classed as adults. For more details on life stage calculations, see Supplementary Materials.

4.3. Design

To assess whether perceived play in pets predicts wellbeing and anxiety, the study followed a regression design with one critical predictor variable (overall perceived play in pets) and two outcome variables (wellbeing; anxiety). We additionally included participant gender and age, participant personality (openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism), species of pet, participant playfulness, and pet life stage as covariates. To assess if perceived pet play differs across species (quasi-independent variable: dog vs. cat) and pet life stage (quasi-independent variable: juvenile vs. adult vs. elderly pet), the study followed a between-subjects ANOVA design with perceived pet play as the dependent variable. Finally, to assess if participant playfulness predicts perceived pet play, the study followed a simple linear regression with participant playfulness as the predictor variable and perceived pet play as the outcome variable.

4.4. Ethics

The current study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the ethics committee of University of Edinburgh on 22 February 2021 (ethics code: 219-2021/1). Informed consent for participation was obtained from all participants involved in the study.

4.5. Materials

All materials for the current study can be viewed online: https://osf.io/xzw8t/?view_only=5a5c1902f94d4a12b79c14b4e4745c06 (accessed on 25 October 2024).

4.5.1. Perceived Play in Pets

Perceived play in pets was measured using the Perceived Play in Pets Scale, a scale which was developed by the current researchers in a series of four studies (see [52]). The Perceived Play in Pets Scale measures pet owners' perceived play behaviour in their pets. Responders are asked to rate the frequency of 19 play behaviours in their pet from '*never*' (scored as zero) to '*a lot (8 or more)*' (scored as five) within the past 24 h. Participants could also state if they felt that the behaviour was inapplicable to cats or dogs (scored as zero). Whilst the scale splits into three subscales which reflect dog play (subscale one), cat play (subscale two) and combined play (subscale three), all play behaviours were totalled to create an overall perceived play in pets score for the purpose of this study. The overall scale was found to have adequate reliability ($\alpha > 0.85$ across all days).

4.5.2. Personal Playfulness

Personal playfulness was measured using the Short Measure for Adult Playfulness (SMAP; [53]), whereby participants rated how much they agreed or disagreed with five items (1 = '*strongly disagree*'; 7 = '*strongly agree*'). An example item is '*I am a playful person*'. The scale had adequate reliability ($\alpha = 0.85$). All items were summed to create a total personal playfulness score. Personal playfulness was only measured on day one.

4.5.3. Wellbeing

Perceived wellbeing was measured using the Psychological Wellbeing Measure from [54], whereby participants rated how much they felt seven states (e.g., '*depressed*') from one '*not at all*' to five '*very much*'. As the original scale was used to measure wellbeing over the past month, and the current study aimed to measure wellbeing only over the past 24 h, the scale was adapted in the following ways: (1) asking participants to which extent they felt each of the states today as opposed to within the last month, (2) changing the item '*that life had been interesting*' to '*that life is interesting*', and (3) amending the response categories from '*none of the time*' and '*all of the time*' to '*not at all*' and '*very much*', respectively. The scale had adequate reliability ($\alpha > 0.86$ across all days). After reverse scoring items one and three, all wellbeing items were summed to give a total wellbeing score, whereby higher scores indicate greater wellbeing. Wellbeing was measured on all five days.

4.5.4. Anxiety

Given that the study was conducted during the COVID-19 pandemic, acute anxiety was measured as directed towards COVID-19 using the seven-item 'The Fear of Coronavirus-19' Scale [55], measured from one '*strongly disagree*' to five '*strongly agree*'. We adapted the scale by changing all references from '*coronavirus-19*' to '*COVID-19*'. An example item is '*I am afraid of COVID-19*'. The scale had adequate reliability ($\alpha > 0.9$ across all days). All items were summed to give a total COVID-19 anxiety score, whereby higher scores indicate greater COVID-19 anxiety. COVID-19 anxiety was measured on all five days.

4.5.5. Personality

To measure personality, an abbreviated version of the Big Five Scale [56] was utilised. Participants were asked to rate how much they agreed or disagreed that 15 traits were representative of themselves (1 = '*disagree strongly*'; 5 = '*agree strongly*'). The scale consists of five subscales (three items each), which measure the five main personality traits: open-mindedness, conscientiousness, extraversion, agreeableness and negative emotionality. The subscales had adequate reliability (open-mindedness: $\alpha = 0.61$; conscientiousness: $\alpha = 0.65$; extraversion: $\alpha = 0.6$; negative emotionality: $\alpha = 0.77$), except for the agreeableness subscale which had inadequate reliability ($\alpha = 0.58$). Results from this subscale should therefore be

interpreted with caution. After reverse-scoring relevant items, all items for each subscale were summed to create a score for each subscale. Higher scores indicate higher levels of that variable. Personality was only measured on day one.

4.5.6. Attention Checks

One attention check per day was implemented in the survey using the following statement '*Please choose "3 Somewhat". This statement forms a check to ensure you are paying attention to the questions.*' Overall, three participants failed one attention check. However, as these participants correctly answered all other attention checks, they were retained within analyses.

4.5.7. Procedure

Participants completed the study via Qualtrics and were recruited via Prolific. Participants firstly provided informed consent before then providing demographic details on themselves and their pet as follows: pet species, pet age, pet breed, participant gender, participant age, nationality, ethnicity and duration of residence in the UK. Participants were told to complete the study only on the pet they personally spent the most of their time with. Participants then completed the scales in the above order. Over the next four days, participants reported if there was any change in their number of pets since the previous day and completed the perceived play in pets, wellbeing and COVID-19 anxiety scales. These daily surveys were completed between 5 p.m. and 9 p.m.

5. Results

The anonymised dataset for the current study can be viewed at https://osf.io/ds3zq/?view_only=504fc8620d374eacb153f862541360c2 (accessed on 25 October 2024).

5.1. Overall Perceived Play

We conducted multiple regressions utilising SPSS V28 on each sample (day one only and all five days) with overall perceived play in pets, pet life stage, personal playfulness, participant gender, participant age, participant personality (consisting of the five OCEAN components: openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism) and pet species as predictor variables. The outcome variables were wellbeing and COVID-19 anxiety. The categorical variables of pet life stage, participant gender and pet species were dummy-coded to enable their inclusion in the regression. 'Adult' was used as the reference category for the pet's life stage (and thus coded as zero with 'juvenile' and 'elder' coded as one in their respective dummy variables), 'female' as the reference category for participant gender (and thus coded as zero with 'male' coded as one) and 'dog' as the reference category for pet species (and thus coded as zero with 'cat' coded as one).

Identical multiple regressions were run on the day one sample only (N = 189) and the full five-day sample (N = 105) to check that any relationships were stable over time. Note that the full five-day sample utilised the summed total scores for wellbeing, COVID-19 anxiety and perceived play in pets across all five days. The regressions passed all the necessary assumptions checks (see Supplementary Materials).

Results of these multiple regressions are summarised for wellbeing and COVID-19 anxiety in Table 1. We summarise the findings for the day-one sample and note that they do not deviate markedly from the five-day sample. The overall models were significant for both wellbeing and COVID-19 anxiety for both the day-one and five-day samples, $p \leq 0.001$. However, overall perceived play did not significantly predict wellbeing on day one, $F(1, 176) = 0.74$, $p = 0.39$, $\eta_p^2 = 0.004$, nor within the five-day sample, $F(1, 92) = 2.14$, $p = 0.15$, $\eta_p^2 = 0.02$, failing to support H1a. Similarly, overall perceived play also did not significantly predict COVID-19 anxiety on day one, $F(1, 176) = 0.15$, $p = 0.7$, $\eta_p^2 = 0.001$, nor within the five-day sample, $F(1, 92) = 0.33$, $p = 0.57$, $\eta_p^2 = 0.004$, failing to support H1b. Overall, there was no evidence that perceived pet play predicted daily wellbeing or COVID-19 anxiety.

Table 1. Overall perceived play regression statistics (day 1).

Predictor	*B*	*SE*	*F*	η_p^2	Adj. R^2
(Outcome Variable 1) Wellbeing			11.09 ***		0.39
Perceived pet play	0.03	0.03	0.74	0.004	
Participant age	0.05	0.03	2.64	0.02	
Personal playfulness	0.05	0.07	0.51	0.003	
Participant gender	−0.95	0.79	1.42	0.01	
Pet species	−0.52	0.69	0.57	0.003	
Juvenile vs. non-juvenile pet	0.28	1.35	0.04	<0.001	
Elderly vs. non-elderly pet	0.65	0.83	0.62	0.003	
Open-mindedness	0.13	0.15	0.8	0.01	
Conscientiousness	0.48	0.15	10 **	0.05	
Extroversion	0.11	0.16	0.45	0.003	
Agreeableness	−0.04	0.16	0.07	<0.001	
Negative emotionality	−0.89	0.13	46.16 ***	0.21	
(Outcome Variable 2) COVID-19 anxiety			5.07 ***		0.21
Perceived pet play	−0.01	0.04	0.15	0.001	
Participant age	0.06	0.04	2.46	0.01	
Personal playfulness	0.23	0.09	6.26 *	0.03	
Participant gender	−2.97	0.97	9.46 **	0.05	
Pet species	0.1	0.84	0.01	<0.001	
Juvenile vs. non-juvenile pet	1.25	1.64	0.58	0.003	
Elderly vs. non-elderly pet	−2.29	1.01	5.14 *	0.03	
Open-mindedness	0.22	0.18	1.55	0.01	
Conscientiousness	0.11	0.18	0.35	0.002	
Extroversion	−0.06	0.19	0.11	0.001	
Agreeableness	0.08	0.19	0.19	0.001	
Negative emotionality	0.77	0.16	23.6 ***	0.12	

Note. * = $p < 0.05$, ** = $p \leq 0.01$, *** = $p \leq 0.001$.

5.2. Pet Life Stage and Perceived Pet Play

To examine the link between pet life stage and perceived play, we conducted two between-subjects ANOVAs with pet life stage as the quasi-independent variable and perceived pet play (on day one for the first ANOVA and over all five days for the second ANOVA) as the dependent variable. Pet life stage had a significant effect on pets' perceived play at both day one (sample size for this day one analysis was $N = 197$, which is the total $N = 200$ who completed day one minus three participants excluded for not providing participant age), $F(2, 194) = 6.17$, $p = 0.003$, $\eta_p^2 = 0.06$ (medium-sized effect), and across all five days (sample size for this five-day analysis was $N = 108$, which is the total $N = 112$ who completed all five days minus three participants excluded for missing at least one perceived play item and another participant excluded for not providing pet age), $F(2, 105) = 4.78$, $p = 0.01$, $\eta_p^2 = 0.08$ (medium-sized effect). Bonferroni-adjusted post hoc analyses revealed that, on day one, owners perceived fewer play behaviours in their elderly pets ($M = 20.09$, $SE = 1.77$) compared to adult pets ($M = 25.44$, $SE = 1.04$), $p = 0.03$, 95% CI [−10.31, −0.39], and juvenile pets ($M = 31.73$, $SE = 3.13$), $p = 0.004$, 95% CI [−20.33, −2.96]. These findings were also present across all five days, whereby elderly pets ($M = 72.06$, $SE = 8.81$) were viewed as displaying fewer play behaviours than adult pets ($M = 99.97$, $SE = 6$), $p = 0.03$, 95% CI [−53.83, −1.99], or juvenile pets ($M = 123.14$, $SE = 18.83$), $p = 0.047$, 95% CI [−101.66, −0.51]. Conversely, juvenile pets did not significantly differ from adult pets in their perceived play either on day one, $p = 0.17$, 95% CI [−1.67, 14.27], or across all five days, $p = 0.73$, 95% CI [−24.91, 71.25].

5.3. Personal Playfulness and Perceived Pet Play

To assess if personal playfulness informed perceptions of pets' play, we conducted two simple linear regressions with personal playfulness as the predictor and perceived pet play (on day one for the first regression and over all five days for the second regression)

as the outcome variable. Personal playfulness significantly predicted perceived pet play on day one (sample size for this day one analysis was $N = 200$, which is the total N = 200 who completed day one with no exclusions), $B = 0.42$, $SE = 0.17$, $F(1, 198) = 6.22$, $p = 0.01$, accounting for 2.6% of variation in perceived pet play (adj. $R^2 = 0.026$; small effect; [57]). Thus, within the day one sample, the more playful someone reported themselves to be, the more play behaviours they perceived within their pets. However, personal playfulness did not significantly predict perceived pet play across all five days (sample size for this day one analysis was $N = 109$, which is the total $N = 112$ who completed all five days minus three participants excluded for missing at least one perceived play item), $F(1, 107) = 1.44$, $p = 0.23$.

5.4. Species and Perceived Pet Play

To determine if perceived play differed across species (dog vs. cat), we also ran two one-way (species: dog vs. cat) between-subjects ANOVAs on overall perceived play (on day one for the first ANOVA and over all five days for the second ANOVA). These analyses revealed that dogs ($M = 27.31$, $SD = 12.35$) were deemed more playful than cats ($M = 22.46$, $SD = 12.42$) on day one (sample size for this day one analysis was $N = 200$, which is the total $N = 200$ who completed day one with no exclusions), $F(1, 198) = 7.65$, $p = 0.01$, $\eta_p^2 = 0.04$ (small-sized effect), and dogs ($M = 107.91$, $SD = 54.22$) were also deemed more playful than cats ($M = 78.1$, $SD = 43.9$) across all five days (sample size for this day one analysis was $N = 109$, which is the total $N = 112$ who completed all five days minus three participants excluded for missing at least one perceived play item), $F(1, 107) = 9.84$, $p = 0.002$, $\eta_p^2 = 0.08$ (medium-sized effect).

6. General Discussion

6.1. H1: Perceived Pet Play on Wellbeing and Anxiety

The current study failed to find evidence that perceived play in pets predicts wellbeing or anxiety. Thus, the current study does not provide support for the play aspect of the human–pet relationship fulfilling a social buffering role against stressful events (i.e., no evidence for any impact on anxiety), and fails to support pet play as a contributing factor to the 'pet effect' (i.e., no evidence for any impact on wellbeing). The current null findings thus do not support H1 and are surprising in light of the extensive evidence that play improves wellbeing for humans [35–41]. However, the current null findings add to the 'pet effect' literature by exploring for the first time within published literature the play component of the human–pet relationship and investigating if this play component contributes to the 'pet effect', with the current study failing to provide support for the extension of the well-known wellbeing benefits of social play across the species barrier. These non-significant findings may also be due to methodological and analytical limitations regarding the Perceived Play in Pets Scale. For instance, the mean total perceived play behaviours were relatively low across the five days ($17.97 \leq M \leq 24.93$), whereby the scale has a total possible score of 95 and a midpoint of 47.5 (i.e., the means were all well below the midpoint). These descriptive statistics indicate either that (a) perceived play behaviours were genuinely low, perhaps explaining the non-significant findings due to infrequent perceived play behaviours, or (b) perceived play behaviours were occurring more frequently than reported but had been forgotten by participants at the time of reporting, due to reliance on participant memory when reporting perceived play behaviours for the past 24 h. Additionally, the time of day of participating in the study (between 5 p.m.–9 p.m.) may have been too early for participants who took part at the start of this timeslot and who work during the day to have engaged yet in significant amounts of perceived play behaviour with pets (i.e., they may not have had time yet to play with pets due to work, and may instead engage in more play behaviours in the evening, leading to underreported play behaviours). Addressing these methodological limitations in future research (e.g., through ecological momentary assessment, rather than reliance on memory) may allow for greater spread of scores in

perceived pet play behaviour and thus a more accurate exploration of any relationship between perceived pet play and wellbeing.

There was an unexpected significant predictor of anxiety; having a non-elderly pet was linked to greater COVID-19 anxiety than having an elderly pet. Although speculative, pet owners of juvenile or adult pets, especially dogs, may have enjoyed significant physical exercise and engagement with the outdoors [58] until this practice was disrupted by the COVID-19 pandemic [59], causing distress and anxiety due to disruption of routine, as well as reduced incidental social interactions with strangers which often occur during dog walking [60,61]. Conversely, pet owners of elderly pets are much less likely to have engaged in as much outdoor activity with their pet due to less energy and physical capability of elderly pets [58], and so these pet owners may have experienced less distress and anxiety, as their day-to-day reality during COVID-19 may not have differed as drastically as owners of younger pets. This interpretation provides some support to previous arguments that the pet effect in dog owners may be driven in part by regular outdoor exercise [62], exposure to green spaces [62], and social contact facilitated [60] by owning a dog. However, this possible explanation can again only be speculative, as we did not measure the level of physical exercise, social interaction and engagement with the outdoors within the current study, nor did we have a baseline comparison outside of COVID-19. Thus, future research may measure these variables, especially now after the COVID-19 pandemic, to determine any contribution they make towards the pet effect.

6.2. Exploratory Analyses on Perceived Pet Play

Exploratory analyses on perceived pet play across pet life stage, personal playfulness and pet species revealed interesting results: elder pets were perceived as engaging in fewer play behaviours than adults or juveniles, dogs were perceived as engaging in more play behaviours than cats, and greater personal playfulness was linked to greater perceived pet play (though only in the day one, and not the five-day, sample, likely due to lack of statistical power in the latter). Such findings are largely to be expected, whereby elderly pets likely engage in less play due to infirmity, compared to younger pets. Previous research also indicates people view dogs' behaviour differently to cats' [50,51], though not yet in a play context to the best of our knowledge. It is possible this finding of more perceived play behaviours in dogs compared to cats arises from the fact that dogs reside within the household within the UK, whereas cats are typically free-roaming within the UK [63] and thus may be outside of the household for the majority of the day, thus increasing the likelihood of owners viewing more play behaviours within dogs compared to cats. Finally, the link between personal playfulness and perceived pet play is also expected, though it is unclear if this relationship is causal, and, if the relationship is causal, in which direction (i.e., do people who are more playful engage in more play with pets, or do people who engage more in pet play perceive themselves as more playful?). Future research could address these questions by causally manipulating perceptions of one's perceived playfulness or the duration and frequency of engaging in playful interactions with pets.

6.3. Limitations and Future Research

The current study has some limitations, including the aforementioned methodological and analytical limitations with the Perceived Pets in Play Scale which we hope can be addressed in future research. The study has limited generalisability given that we recruited UK citizens only. Indeed, it is possible that perceived play behaviours in cats may be lower in the UK compared to the US, where most cats tend to be kept indoors [63], thus increasing the likelihood of witnessing play behaviours in cats in other national or cultural contexts where free-roaming cats are not the norm [63]. Future research should therefore explore perceived play in other cultures and perhaps include cross-cultural comparisons. The sample also has other limitations. For instance, the sample was recruited via Prolific, a self-selected sample who are being reimbursed for participation and who may therefore differ from the wider population. The sample may also not be representative of the wider

population due to its demographics, with the majority of the sample being female (74.6%) and White (89.9%). As such, future research should recruit alternative samples more balanced and representative of gender and ethnicity, and through alternative recruitment avenues besides Prolific. Finally, the current study only explored perceived play in the most common pets (dogs and cats), leaving scope for future research to explore perceived play in other pets (e.g., rabbits, mice, guinea pigs) with the development of new versions of the Perceived Pets in Play Scale.

7. Conclusions

The current study has uniquely explored if play within the human–pet relationship contributes to wellbeing and anxiety during a time of acute stress (the COVID-19 pandemic), and unexpectedly did not find support for perceived play in pets informing wellbeing or anxiety. Considering play more generally, the current study has shed light on differences in perceived play behaviour across cats and dogs (with dogs being perceived as engaging in more play behaviours than cats), across pet lifespan (with elderly pets being perceived as engaging in fewer play behaviours than adults or juveniles), and depending on one's personal playfulness (with greater personal playfulness being linked to greater perceived pet play), which speaks to the utility of both the Perceived Pets in Play Scale and Short Measure for Adult Playfulness in this context. Overall, the current study is the first to systematically explore perceived play in pets and opens up avenues for future research to determine the exact role of play within the human–pet relationship.

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References

1. British Medical Association. Mental Health Pressures in England. Available online: https://www.bma.org.uk/advice-and-support/nhs-delivery-and-workforce/pressures/mental-health-pressures-data-analysis (accessed on 18 October 2024).
2. Robinson, L.; Segal, J. The health and Mood-Boosting Benefits of Pets. Available online: https://www.helpguide.org/articles/mental-health/mood-boosting-power-of-dogs.htm (accessed on 18 October 2024).
3. Clarabut, J. Pets Can Contribute to Greater Personal Wellbeing. Available online: https://wellbeingpeople.com/optimal-wellbeing/pets-can-contribute-to-greater-personal-wellbeing/2023/ (accessed on 18 October 2024).
4. Feldman, S. Why Owning a Pet Is Good for Body and Mind. Available online: https://www.theguardian.com/lifeandstyle/2023/feb/17/why-owning-a-pet-is-good-for-body-and-mind (accessed on 18 October 2024).
5. American Psychiatric Association. Pets and Mental Health: Social Media Toolkit. Available online: https://www.psychiatry.org/news-room/apa-blogs/pets-and-mental-health-social-media-toolkit (accessed on 18 October 2024).
6. Cats Protection. CATS Report 2023. Available online: https://www.cats.org.uk/about-cp/cats-report (accessed on 18 October 2024).
7. Allen, K. Are Pets a Healthy Pleasure? The Influence of Pets on Blood Pressure. *Curr. Dir. Psychol. Sci.* **2003**, *12*, 236–239. [CrossRef]

8. Herzog, H. The Impact of Pets on Human Health and Psychological Well-Being: Fact, Fiction, or Hypothesis? *Curr. Dir. Psychol. Sci.* **2011**, *20*, 236–239. [CrossRef]
9. Barcelos, A.M.; Kargas, N.; Maltby, J.; Hall, S.; Mills, D.S. A Framework for Understanding How Activities Associated with Dog Ownership Relate to Human Well-Being. *Sci. Rep.* **2020**, *10*, 11363. [CrossRef] [PubMed]
10. Brooks, H.L.; Rushton, K.; Lovell, K.; Bee, P.; Walker, L.; Grant, L.; Rogers, A. The Power of Support from Companion Animals for People Living with Mental Health Problems: A Systematic Review and Narrative Synthesis of the Evidence. *BMC Psychiatry* **2018**, *18*, 31. [CrossRef]
11. Ellis, A.; Stanton, S.C.E.; Hawkins, R.D.; Loughnan, S. The Link between the Nature of the Human–Companion Animal Relationship and Well-Being Outcomes in Companion Animal Owners. *Animals* **2024**, *14*, 441. [CrossRef]
12. Hawkins, R.D.; Hawkins, E.L.; Tip, L. "I Can't Give up When I Have Them to Care for": People's Experiences of Pets and Their Mental Health. *Anthrozoos* **2021**, *34*, 543–562. [CrossRef]
13. Bolstad, C.J.; Porter, B.; Brown, C.J.; Kennedy, R.E.; Nadorff, M.R. The Relation between Pet Ownership, Anxiety, and Depressive Symptoms in Late Life: Propensity Score Matched Analyses. *Anthrozoos* **2021**, *34*, 671–684. [CrossRef]
14. Martinez-Caja, A.M.; De Herdt, V.; Enders-Slegers, M.-J.; Moons, C.P.H. Pet Ownership, Feelings of Loneliness, and Mood in People Affected by the First COVID-19 Lockdown. *J. Vet. Behav.* **2022**, *57*, 52–63. [CrossRef]
15. Tower, R.B.; Nokota, M. Pet Companionship and Depression: Results from a United States Internet Sample. *Anthrozoos* **2006**, *19*, 50–64. [CrossRef]
16. Cheung, C.; Kam, P.K. Conditions for Pets to Prevent Depression in Older Adults. *Aging Ment. Health* **2018**, *22*, 1627–1633. [CrossRef]
17. Antonacopoulos, N.M.D.; Pychyl, T.A. An Examination of the Potential Role of Pet Ownership, Human Social Support and Pet Attachment in the Psychological Health of Individuals Living Alone. *Anthrozoos* **2010**, *23*, 37–54. [CrossRef]
18. Hutton, V.E. Social Provisions of the Human—Animal Relationship amongst 30 People Living with HIV in Australia. *Anthrozoos* **2015**, *28*, 199–214. [CrossRef]
19. Headey, B. Old Age Is Not Downhill: The Satisfactions and Well-being of Older Australians. *Australas. J. Ageing* **1999**, *18*, 32–37. [CrossRef]
20. Kikusui, T.; Winslow, J.T.; Mori, Y. Social Buffering: Relief from Stress and Anxiety. *Philos. Trans. R. Soc. B Biol. Sci.* **2006**, *361*, 2215–2228. [CrossRef] [PubMed]
21. Kar, N.; Kar, B.; Kar, S. Stress and Coping during COVID-19 Pandemic: Result of an Online Survey. *Psychiatry Res.* **2021**, *295*, 113598. [CrossRef]
22. Ratschen, E.; Shoesmith, E.; Shahab, L.; Silva, K.; Kale, D.; Toner, P.; Reeve, C.; Mills, D.S. Human-Animal Relationships and Interactions during the Covid-19 Lockdown Phase in the UK: Investigating Links with Mental Health and Loneliness. *PLoS ONE* **2020**, *15*, e0239397. [CrossRef]
23. Grajfoner, D.; Ke, G.N.; Wong, R.M.M. The Effect of Pets on Human Mental Health and Wellbeing during COVID-19 Lockdown in Malaysia. *Animals* **2021**, *11*, 2689. [CrossRef]
24. McDonald, S.E.; O'connor, K.E.; Matijczak, A.; Tomlinson, C.A.; Applebaum, J.W.; Murphy, J.L.; Zsembik, B.A. Attachment to Pets Moderates Transitions in Latent Patterns of Mental Health Following the Onset of the COVID-19 Pandemic: Results of a Survey of US Adults. *Animals* **2021**, *11*, 895. [CrossRef]
25. Albright, A.E.; Cui, R.; Allen, R.S. Pet Ownership and Mental and Physical Health in Older White and Black Males and Females. *Int. J. Environ. Res. Public Health* **2022**, *19*, 5655. [CrossRef]
26. Gilbey, A.; Tani, K. Companion Animals and Loneliness: A Systematic Review of Quantitative Studies. *Anthrozoos* **2015**, *28*, 181–197. [CrossRef]
27. Toohey, A.M.; Hewson, J.A.; Adams, C.L.; Rock, M.J. Pets, Social Participation, and Aging-in-Place: Findings from the Canadian Longitudinal Study on Aging. *Can. J. Aging/La Rev. Can. Du Vieil.* **2018**, *37*, 200–217. [CrossRef]
28. Fraser, G.; Huang, Y.; Robinson, K.; Wilson, M.S.; Bulbulia, J.; Sibley, C.G. New Zealand Pet Owners' Demographic Characteristics, Personality, and Health and Wellbeing: More than Just a Fluff Piece. *Anthrozoos* **2020**, *33*, 561–578. [CrossRef]
29. Mueller, M.K.; King, E.K.; Callina, K.; Dowling-Guyer, S.; McCobb, E. Demographic and Contextual Factors as Moderators of the Relationship between Pet Ownership and Health. *Health Psychol. Behav. Med.* **2021**, *9*, 701–723. [CrossRef]
30. Burghardt, G.M. Play: Attributes and Neural Substrates. *Dev. Psychobiol.* **2001**, *13*, 317–356. [CrossRef]
31. Burghardt, G.M. *The Genesis of Animal Play: Testing the Limits*; MIT Press: Cambridge, MA, USA, 2005.
32. Burghardt, G.M. Defining and Recognizing Play. In *The Oxford Handbook of the Development of Play*; Pellegrini, A.D., Ed.; Oxford University Press: Oxford, UK, 2011; pp. 9–18.
33. Graham, K.L.; Burghardt, G.M.; Wiens, J.J. Current Perspectives on the Biological Study of Play: Signs of Progress. *Q. Rev. Biol.* **2010**, *85*, 393–418. [CrossRef]
34. Proyer, R.T.; Ruch, W. The Virtuousness of Adult Playfulness: The Relation of Playfulness with Strengths of Character. *Psychol. Well-Being Theory Res. Pract.* **2011**, *1*, 4. [CrossRef]
35. Trezza, V.; Baarendse, P.J.J.; Vanderschuren, L.J.M.J. The Pleasures of Play: Pharmacological Insights into Social Reward Mechanisms. *Trends Pharmacol. Sci.* **2010**, *31*, 463–469. [CrossRef]
36. Vanderschuren, L.J.M.J.; Achterberg, E.J.M.; Trezza, V. The Neurobiology of Social Play and Its Rewarding Value in Rats. *Neurosci. Biobehav. Rev.* **2016**, *70*, 86–105. [CrossRef]

37. Magnuson, C.D.; Barnett, L.A. The Playful Advantage: How Playfulness Enhances Coping with Stress. *Leis. Sci.* **2013**, *35*, 129–144. [CrossRef]
38. Staempfli, M.B. Adolescent Playfulness, Stress Perception, Coping and Well Being. *J. Leis. Res.* **2007**, *39*, 393–412. [CrossRef]
39. Proyer, R.T. Examining Playfulness in Adults: Testing Its Correlates with Personality, Positive Psychological Functioning, Goal Aspirations, and Multi-Methodically Assessed Ingenuity. *Psychol. Test. Assess. Model.* **2012**, *54*, 103–127. [CrossRef]
40. Proyer, R.T. The Well-Being of Playful Adults. *Eur. J. Humour Res.* **2013**, *1*, 84–98. [CrossRef]
41. Proyer, R.T. Playfulness over the Lifespan and Its Relation to Happiness: Results from an Online Survey. *Z. Gerontol. Geriatr.* **2014**, *47*, 508–512. [CrossRef]
42. Yarnal, C.; Qian, X. Older-Adult Playfulness: An Innovative Construct and Measurement for Healthy Aging Research. *Am. J. Play* **2011**, *4*, 52–79.
43. Clifford, C.; Paulk, E.; Lin, Q.; Cadwallader, J.; Lubbers, K.; Frazier, L.D. Relationships among Adult Playfulness, Stress, and Coping during the COVID-19 Pandemic. *Curr. Psychol.* **2024**, *43*, 8403–8412. [CrossRef]
44. McCoy, E.; Lonn, A.; Harasymchuk, C. Interpersonal Playfulness as a Protective Factor Against Loneliness and Boredom in Single People Living Alone during the COVID-19 Lockdown. *Leis. Sci.* **2023**, 1–18. [CrossRef]
45. Chang, P.-J.; Qian, X.; Yarnal, C. Using Playfulness to Cope with Psychological Stress: Taking into Account Both Positive and Negative Emotions. *Int. J. Play* **2013**, *2*, 273–296. [CrossRef]
46. Blazina, C.; Kogan, L. Do Men Underreport and Mask Their Emotional Attachment to Animal Companions? The Influence of Precarious Masculinity on Men's Bonds with Their Dogs. *Anthrozoos* **2019**, *32*, 51–64. [CrossRef]
47. Keyes, H.; Gradidge, S.; Gibson, N.; Harvey, A.; Roeloffs, S.; Zawisza, M.; Forwood, S. Attending Live Sporting Events Predicts Subjective Wellbeing and Reduces Loneliness. *Front. Public Health* **2023**, *10*, 989706. [CrossRef]
48. Reevy, G.M.; Delgado, M.M. Are Emotionally Attached Companion Animal Caregivers Conscientious and Neurotic? Factors That Affect the Human–Companion Animal Relationship. *J. Appl. Anim. Welf. Sci.* **2015**, *18*, 239–258. [CrossRef]
49. Smith, L.; Jacob, L.; Yakkundi, A.; McDermott, D.; Armstrong, N.C.; Barnett, Y.; López-Sánchez, G.F.; Martin, S.; Butler, L.; Tully, M.A. Correlates of Symptoms of Anxiety and Depression and Mental Wellbeing Associated with COVID-19: A Cross-Sectional Study of UK-Based Respondents. *Psychiatry Res.* **2020**, *291*, 113138. [CrossRef]
50. Feuerstein, N.; Terkel, J. Interrelationships of Dogs (*Canis familiaris*) and Cats (*Felis catus* L.) Living under the Same Roof. *Appl. Anim. Behav. Sci.* **2008**, *113*, 150–165. [CrossRef]
51. Menchetti, L.; Calipari, S.; Mariti, C.; Gazzano, A.; Diverio, S. Cats and Dogs: Best Friends or Deadly Enemies? What the Owners of Cats and Dogs Living in the Same Household Think about Their Relationship with People and Other Pets. *PLoS ONE* **2020**, *15*, e0237822. [CrossRef]
52. Gibson, N.; Gradidge, S.; Schwing, R.; Smith, A.; Wascher, C.; Loughnan, S. Development of the Perceived Play in Pets Scale: Evidence for Perceived Species-Specific Play. *manuscript in preparation*.
53. Proyer, R.T. Development and Initial Assessment of a Short Measure for Adult Playfulness: The SMAP. *Personal. Individ. Differ.* **2012**, *53*, 989–994. [CrossRef]
54. McDonald-Miszczak, L.; Wister, A.V. Predicting Self-Care Behaviors among Older Adults Coping with Arthritis: A Cross-Sectional and 1-Year Longitudinal Comparative Analysis. *J. Aging Health* **2005**, *17*, 836–857. [CrossRef]
55. Ahorsu, D.K.; Lin, C.-Y.; Imani, V.; Saffari, M.; Griffiths, M.D.; Pakpour, A.H. The Fear of COVID-19 Scale: Development and Initial Validation. *Int. J. Ment. Health Addict.* **2022**, *20*, 1537–1545. [CrossRef]
56. Soto, C.J.; John, O.P. The next Big Five Inventory (BFI-2): Developing and Assessing a Hierarchical Model with 15 Facets to Enhance Bandwidth, Fidelity, and Predictive Power. *J. Personal. Soc. Psychol.* **2017**, *113*, 117. [CrossRef]
57. Cohen, J. *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed.; Routledge: Oxfordshire, UK, 2013. [CrossRef]
58. Degeling, C.; Rock, M. 'It Was Not Just a Walking Experience': Reflections on the Role of Care in Dog-Walking. *Health Promot. Int.* **2013**, *28*, 397–406. [CrossRef]
59. Vučinić, M.; Vučićević, M.; Nenadović, K. The COVID-19 Pandemic Affects Owners Walking with Their Dogs. *J. Vet. Behav.* **2022**, *48*, 1–10. [CrossRef]
60. Wells, D.L. The Facilitation of Social Interactions by Domestic Dogs. *Anthrozoos* **2004**, *17*, 340–352. [CrossRef]
61. Wood, L.; Martin, K.; Christian, H.; Nathan, A.; Lauritsen, C.; Houghton, S.; Kawachi, I.; McCune, S. The Pet Factor-Companion Animals as a Conduit for Getting to Know People, Friendship Formation and Social Support. *PLoS ONE* **2015**, *10*, e0122085. [CrossRef] [PubMed]
62. White, M.P.; Elliott, L.R.; Wheeler, B.W.; Fleming, L.E. Neighbourhood Greenspace Is Related to Physical Activity in England, but Only for Dog Owners. *Landsc. Urban Plan.* **2018**, *174*, 18–23. [CrossRef]
63. Foreman-Worsley, R.; Finka, L.R.; Ward, S.J.; Farnworth, M.J. Indoors or Outdoors? An International Exploration of Owner Demographics and Decision Making Associated with Lifestyle of Pet Cats. *Animals* **2021**, *11*, 253. [CrossRef]